

THE CRATER.

A SCIENTIFIC DESCRIPTION OF THE BURNING LAKE.

Kilauea in August, 1892: By Frank S. Dodge of the Government Survey.

(From American Journal of Science, March.)

By direction of Prof. W. D. Alexander, Surveyor-General, the writer was sent to Kilauea in August, 1892, to make such surveys as were necessary to determine the changes that had taken place since the last survey in 1888.

While it is unfortunate for the history of Kilauea in recent years that no instrumental survey was made immediately after the great break-down of March, 1891, we have estimates by careful observers of the depth of the pit at that time, which range from 450 to 500 feet below the edge, or 750 to 800 below the Volcano House datum, as compared with 800 feet after the collapse of March, 1888.

From triangulation, with "Ukahuna" and V. H. (triangle) as a base, four points on the edge of Halema'uma'u were accurately located and their elevations determined, and from these points the whole periphery was surveyed by stadia measurements. From these same points, a large number of sights were taken on small flags on the very rim of the burning lake, to closely fix its exact size, shape and elevation, and the results are all given on the maps.

This survey gives the total area of Halema'uma'u as 100.4 acres, and that of the active lake as 12.1 acres, or equal to that of a circle with a diameter of 820 feet, which is much larger than any lake in Kilauea in recent years. Dana Lake in 1888 was not more than 380 feet in diameter or 1.6 acres in area. The present lake is nearly circular in form, its longest diameter being 880 feet, and the shortest 800 feet. The entire rim stands at about the same level—519, or about 240 feet below the edge of Halema'uma'u, at the eastern station.

During my various visits, covering a period of seven days, the lava was about three feet below the rim, on an average, but was subject to a variation in level of four or five feet. Frequent breaks occurred in the rim, from which large flows took place, in some cases covering several acres of the floor. One large flow on the night of August 25th, extended to the foot of the talus slope, on the north and east sides, and covered about one-third of the floor, and raised its level from one to four feet. The lake itself and the surrounding area are rising slowly but surely, and it seems to be a matter of only a few months when Halema'uma'u will again be filled to the brim, and run over the sides, building up the main floor of the crater, as it did in 1888-91.

The deepest portions of the pit are at the foot of the talus slopes on all sides, with a gradual rise of ten or fifteen feet toward the rim of the lake, and then a more abrupt rise to the lake itself, as shown in the sections. The lake was at times very active, with fountains playing over its surface in every direction, as many as fifteen being counted at one time by a careful observer. The greatest activity was at or near the center, where the largest fountain played almost continuously, and along the edge near the south-west side of the lake, where the overflows were most frequent. But at no time was the entire surface at rest, as was the case in Dana Lake during the short periods of its visits in July, 1888. Small fountains were always to be seen in some locality, and the whole surface was marked by long irregular seams or cracks always in motion. It was an interesting and fascinating sight, as we watched the ever-changing features of the lake, from our point of view on the north bank, some 250 feet above it.

The surrounding walls of Halema'uma'u are absolutely vertical on all sides, with one exception for 100 feet or more, from the upper edge to the talus slope, and at that one place only is it well to attempt a descent into the pit. On the north-east side for a short distance, the walls are broken down, and here it is possible for visitors to descend to a point forty feet or more below the level of the lake, and then to climb up to the very rim of the lake. It is not difficult for a good climber, and several parties of ladies have recently accomplished it without great risk. The descent and the nearer views of the lake are well worth the extra trouble and fatigue, but care must be taken to avoid the strong currents of sulphurous vapors to be found on the lee side of the lake. Their presence was much more noticeable than around the lake in 1888.

Mr. S. E. Bishop in his article of April, 1892, has well described the condition of the lake and its most important features. His description applies to its condition in August. Considering the means at his disposal, his results are very close approximations, and show careful work; but the latter instrumental survey shows that he over-estimated the diameter of the lake by about 100 feet. His diameter of Halema'uma'u, 2400 feet, agrees very nearly with mine, as given in the table at the end of this article.

As shown on Bishop's map of April,

and my later one, the location of Halema'uma'u is almost identical with that of 1888, and the new lake is exactly over the mouth of the great funnel-shaped depression shown by Mr. J. S. Emerson in April, 1888, but eastward of the Dana Lake of 1888. The area of Halema'uma'u is now much less than in '88, being about 100 acres, as compared with 153 acres by Mr. Emerson's survey.

Of the general condition of Kilauea little may be said, as the changes are hardly noticeable. With the building up of the Halema'uma'u cone, in the period from 1888 to March, 1891, the summit was changed from Central Rock, with an elevation of -321, to a point directly north of the great pit, with an elevation of -382, a rise of 59 feet. The whole region to the east and south, by the same agency, was raised until it exceeds Central Rock in height by about 40 feet, and on the west side about 30 feet, making the conical form of Halema'uma'u more noticeable.

The trail over the old floor of Kilauea has been improved somewhat and marked by stone monuments at frequent intervals throughout its length, and there is a trail entirely around Halema'uma'u and another leading to some interesting caves southwest of the pit.

The new Volcano House is a vast improvement over the old one, and should be well patronized by tourists and others, as it is exceedingly well conducted and all necessary comforts are provided by the present management.

With the completion of the new Government road from Hilo the Volcano of Kilauea should have a much larger number of visitors than ever before.

In making my recent survey, valuable assistance was rendered by Mr. W. E. Wall of the Government Survey, and also by the manager and guides at the Volcano House.

DIMENSIONS AND ELEVATIONS IN AUGUST, 1892.

	Feet.
Greatest diameter of Halema'uma'u.....	2,600
Least diameter of Halema'uma'u.....	2,150
Greatest diameter of lake.....	880
Least diameter of lake.....	800
Area of lake.....	12.1
Area of Halema'uma'u.....	100.4
Area of Halema'uma'u in 1888.....	153

ELEVATIONS.

	Feet.
Halema'uma'u, north (highest point of cone).....	-382
Halema'uma'u, east.....	-275
Halema'uma'u, southwest.....	-285
Halema'uma'u, northwest.....	-300
Lowest point in pit (at foot of slope).....	-565
Depth of pit (from Halema'uma'u, northwest).....	-265
Rim of lake.....	-519
Surface of lava in lake.....	-522

WOMEN ORGANIZE.

A Branch of the Hawaiian Patriotic League is Formed.

A meeting of Hawaiian women was held in Arion Hall March 27, afternoon. It was well attended. The ladies organized a society to be known as a branch of the Hawaiian Patriotic League.

The President-elect, Mrs. F. W. Macfarlane, made a brief address in which she gave an outline of the aims of the organization. According to her statement the society was formed chiefly to act as a committee of welcome to the members of the United States Commission when they arrive.

The election of officers resulted as follows: Honorary Presidents: Mrs. T. R. Foster, Mrs. F. S. Pratt, Mrs. J. A. Cummins, Mrs. S. C. Allen and Mrs. C. A. Brown. President: Mrs. F. W. Macfarlane. Vice-Presidents: Mrs. Jas. Campbell and Mrs. C. O. Berger. Secretary: Mrs. Kahalewai. Honorary Secretary: Mrs. C. P. Ward.

Treasurer: Mrs. W. M. Giffard. Executive Committee: Mrs. F. W. Macfarlane, Mrs. J. Nawahi, Mrs. J. Kane, Mrs. W. L. Wilcox, Mrs. L. Aholo, Mrs. James Gay, Miss Hattie Hairam, Mrs. Lemoo, Mrs. A. A. Haalelela, Mrs. C. O. Berger, Mrs. M. Mabelona, Mrs. M. Kahai, Mrs. W. H. Aldrich, Mrs. M. E. Keokakole.

Finance Committee: Mrs. S. H. Meekap, Mrs. G. W. Miles, Mrs. E. Norrie, Mrs. H. H. Webb, Mrs. A. Joy, Mrs. Kasepa, Miss Doiron, Mrs. C. Sherratt, Mrs. Malopo, and Mrs. J. B. Holt.

About 160 ladies signed the roll-call, the last name being signed after 5 o'clock. Among the other ladies present were Mrs. H. R. Macfarlane, Mrs. J. K. Kahookano, Mrs. S. Parker, Mrs. J. H. Wodehouse, Jr., Mrs. A. N. Tripp, Mrs. C. L. Hopkins, Mrs. T. E. Evans, Mrs. W. L. Kaholokahiki.

Committed to the Asylum.

W. J. Roche, who was a government employee under the Gibson regime, has been committed to the Insane Asylum. He left this city during the first part of last week to accept a position as school teacher at Unupalakua, Maui. On last Thursday he showed the first symptoms of insanity by going about and declaring that he had been assaulted the night before by a detachment of marines from an American man-of-war. While he was being examined he imagined he was to be hung for writing treasonable articles about the government. Alcoholism is supposed to be the cause of his trouble.

FOREIGN NEWS.

THE UNITED STATES TREASURY HAS TOO MUCH GOLD.

Death of Jules Ferry—A Vanderbilt Dead—Cleveland's New Party.

The Honduras Revolution.

PANAMA, March 19.—Advices from Honduras give an account of a battle which took place a week ago at a place called Santa Lucia, near Ysacaran. The battle lasted the greater part of two days. The Government troops, commanded by General Villala, attacked the position held by Policarpe, Bonilla's chief. General Terrence Sierra Villala was forced to surrender. The battle was the bloodiest one which has taken place during the revolution. One hundred and fifty men were killed on the field, of whom 100 belonged to Villala's army. General Bonilla has occupied Jitacalpa, meeting no resistance. He also captured 500 rifles.

Fire at Boston.

Boston, March 19.—Fire broke out about 7 o'clock this morning in the Tremont Temple, and before noon the entire structure had been gutted, entailing a loss, roughly estimated, at \$475,000. Fireman Patrick Dunn, of Engine 26, had a leg broken, and another man, name unknown, is reported to be seriously injured.

Voyage of the Shenandoah.

NEW YORK, March 19.—After a prolonged voyage of 362 days, during which she twice rounded the Horn and twice crossed the Atlantic; met and vanquished the fast British ship Kensington on an ocean race, and finally fell in with a whole family of waterspouts, the American ship Shenandoah arrived in port yesterday. The waterspouts were sighted five days ago about 500 miles off the coast.

Salisbury Has a Relapse.

LONDON, March 19.—Lord Salisbury is again confined to his bed, and has been forbidden by his physician to attend to any business whatever.

Too Much Gold.

WASHINGTON, March 18.—The Treasury Department is receiving offers of gold for small notes in such number that it cannot accept them all. To-day it accepted an additional offer of \$1,000,000 from Chicago. It is thought by next week the free gold in the treasury will aggregate between \$6,000,000 and \$7,000,000. A gain of \$800,000 in gold was made at New York yesterday. No gold was taken for export.

NEW YORK, March 18.—The bank statement is as follows: Reserve increase, \$1,396,000; specie, decrease \$211,000. The banks now hold \$3,039,000 in excess of requirements.

End of Jules Ferry.

PARIS, March 17.—Jules Francois Camille Ferry, the French statesman, is dead. M. Ferry's death was caused by heart disease. The affection of the heart, from which he suffered, was due to the effect of a bullet striking a rib near the base of the heart at the time he was attacked by Anberlin in 1887. He was seized with spasms early in the morning, and despite every effort made by the physicians who were hastily summoned, the convulsions continued to grow in violence until 6 o'clock in the evening, when he expired in a terribly severe spasm.

A Vanderbilt Dead.

NEW BRITAIN, S. I., March 19.—Captain Jacob Hand Vanderbilt, brother of the late Commodore Vanderbilt, died at his home at Grimes Hill, Staten Island, at 6 o'clock this evening. He had an attack of congestion of the lungs two weeks ago, and for several days his death was expected. His son, J. H. Vanderbilt, Jr., was alone at his bedside with a nurse at the time of his death, his daughters and nephew, Cornelius Vanderbilt, having left the house a short time before the end came.

Explosion of a Locomotive.

BUTTE, Mont., March 18.—A fifty-ton Grant locomotive exploded to-day, instantly killing Conductor P. J. Winkeyron of Watertown, Wis., and Switchman John Kane of California. Engineer Paul Featherkite of Missouri was fatally and fireman James Mulligan seriously injured.

Crispi in the Deal.

PARIS, March 18.—Le Rappel, a radical journal, has created a sensation by publishing a statement to the effect that the liquidator of the estate of Baron Reinach has told the Panama investigating committee of a document which gives the names and dates of various Panama payments, including one of 50,000 francs to Crispi, the former Prime Minister of Italy.

In the trial of Charles de Lesseps and his associates to-day Waldeck Rousseau made an eloquent appeal to the jury for mercy to his client, Bihaut. Barnett, in his argument in behalf of ex-Deputy Sans Leroy, sought to sustain by documentary evidence the story that Sans Leroy, at the time he deposited the amount alleged to have been given to him by Arton as a bribe, was simply reinvesting his wife's dowry.

Rome, March 18.—It is stated that Signor Crispi acted in Italy for Ba-

ron de Reinach's firm from 1886 until the time of his accession to power, and that the Baron de Reinach, in 1891, begged Crispi to resume his position, and at the same time paid Crispi the arrears of fees due for his former services. These statements are regarded as a sufficient explanation of the Paris Rappel's revelations.

The King Got a Fright.

LONDON, March 19.—King Carlos, Queen Marie Amalie and the members of the Cabinet went on a special train to Caldas da Raina to-day to open a hospital. The train ran off the track at Campolide, and all the passengers were thrown off the seats. Aside from the fright caused by the shock, however, nobody suffered from the accident. After two hours' waiting the royal party proceeded on another train.

Tariff Reform.

NEW YORK, March 18.—E. Ellery Anderson, chairman of the Committee on Tariff Reform of the Reform Club, said this morning that he was hard at work preparing a tariff bill, which the club will submit to Secretary Carlisle for the approval of the administration and submission to Congress when it assembles.

"The bill will be in harmony with the Chicago platform," said Anderson. "Duties will be fixed on a revenue basis only, but we will try to arrange them so that no industry will be crippled."

Anderson said that he could not give any details of the bill at this time.

Will Write a Book.

INDIANAPOLIS, March 18.—Ex-President Harrison has written to a friend that he will return to this city to-day. He proposes to begin the preparations of his book at once, and has made arrangement with Frank Tibbott, for four years his private stenographer, to continue with him in that capacity for the next three or four months. The ex-President will be busy arranging data for his work on the tariff, and the entire book will be dictated to his stenographer and then copied on a typewriter and revised.

Collector for San Francisco.

WASHINGTON, March 17.—"John H. Wise for Collector of Customs at San Francisco." This is the only appointment that has been positively decided upon as yet by the California delegation. The delegation is united upon Wise, and no doubt is expressed as to his appointment.

Naval Review.

WASHINGTON, March 18.—The following general order in connection with the naval review next May has been issued by Admiral Gherardi: The organization of the fleet will be as follows: Rear-Admiral Gherardi, commander in chief; Rear-Admiral A. E. K. Benham, commanding first squadron; and Rear-Admiral John G. Walker, commanding second squadron. The Philadelphia will be the flagship and the Cushing the dispatch boat. The first squadron will be composed of the Newark, the flagship, the Atlanta, San Francisco, Bancroft, Bennington and Baltimore. The second squadron will have the Chicago as flagship, with the Yorktown, Charleston, Vesuvius, Concord and Mainomah.

Work of Revenge.

ROME, March 18.—Yesterday's attempt to blow up the Ancini Mattei Palace, occupied by United States Minister Potter, was followed to-day by a like attempt at the Palazzo Altieri, headquarters of the Guards Nobili, a military organization and Pope's bodyguard at all great religious functions. A dynamite bomb, encased in plaster of Paris with a burning fuse, was discovered by a passing boy, who stamped out the fuse with his feet and notified the police. It is believed these outrages are the work of anarchists in revenge for the arrest of several of their number.

Smallpox in British Columbia.

VICTORIA, B. C., March 16.—Three smallpox patients on the North Pacific steamship Tacoma were landed at Albert Head last evening and placed in a ward. Later all the Chinese passengers on the boat were landed and quarters provided for them. Three cases developed on March 4, and it is thought no more cases will develop.

A Manifesto Issued.

LONDON, March 16.—The unionists' manifesto has been issued over the signatures of the Duke of Abercorn, the Marquis of Londonderry, Earl Erne, Lord Arthur Hill, Colonel Sanderson, the Mayors of Belfast and Londonderry and others. The manifesto announces the formation of an Ulster Defense League, "not merely to continue the struggle for union, but to prepare to meet any contingency."

The signers call upon all unionists to qualify at once as members of the league. The two necessary qualifications for every successful applicant are that he be a full grown man and that he pledge himself to be faithful to the cause of union. Those enrolled as members will send delegates to Belfast to form a central assembly of 600 members, which will elect a governing council of sixty. The last words of the manifesto are: "Be patient, enroll and combine."

A New Party.

WASHINGTON, March 16.—A hint of Cleveland's policy of building up a new party is given. Following the selection of Judge Gresham for his Cabinet, it is said he is going to appeal to sentimental Republicans by keeping Minister Lincoln at London and Minister Fred Grant at Vienna.

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